

WHAT IS CLAIMED IS

- An optic tracking device for controlling a cursor of a computer display, the optic tracking device comprising:
- 5 a pad having a surface on which a number of light reflective zones are formed and spaced from each other by light absorbing zones;
- 10 a body movable on the surface of the pad, the body having a bottom positioned on the surface of the pad and defining a cavity;
- 15 a light emitting element adapted to project a light onto the pad whereby the light is selectively reflected by the light reflective zones and absorbed by the light absorbing zones;
- 20 an optic sensor received in the cavity, the optic sensor comprising a number of photo transistors arranged in a predetermined pattern for detecting an optic signal caused by the reflected light in different directions and each generating a primary electrical signal corresponding to the detection;
- 25 a signal processing circuit having input terminals respectively connected to the photo transistors to receive the primary electrical signals of the photo transistors, the primary electrical signals being processed by the signal processing circuit to generate an output signal indicating moving speed and direction of the body with respect to the pad.
2. The optic tracking device as claimed in Claim 1, wherein the optic sensor comprises a transparent casing encasing the photo transistors.

- 1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
3. The optic tracking device as claimed in Claim 1, wherein the light emitting element comprises a light emitting diode.
4. The optic tracking device as claimed in Claim 1, wherein the signal processing circuit comprises:
- 5 a signal conversion circuit connected to each photo transistor to receive the primary electrical signal and generating a secondary electrical signal; and
- 10 a microprocessor having input terminals to which the secondary electrical signals are applied and an output terminal, the microprocessor performing a predetermined operation to process the secondary electrical signals for generation of an output signal that indicates the moving speed and direction of the movable body at the output terminal thereof.
- 15 5. The optic tracking device as claimed in Claim 4, wherein each secondary electrical signal comprises a series of square waves.
- 20 6. The optic tracking device as claimed in Claim 4, wherein the signal conversion circuit comprises first and second operational amplifiers having first and second positive input terminals connected to the photo transistor to receive the primary electrical signal, the first operational amplifier having a first negative input terminal coupled to a first output terminal thereof for generation of a delayed reference signal at the first output terminal, the second operational amplifier having a second negative input terminal coupled to the first output terminal to receive the delayed reference signal and a second output terminal for generation of the secondary electrical signal based on comparison between the primary electrical signal and the delayed

reference signal.

7. The optic tracking device as claimed in Claim 6, wherein each operational amplifier has hysteresis characteristics of the output terminal with respect to the positive input terminal thereof.
- 5 8. The optic tracking device as claimed in Claim 6, wherein the secondary electrical signal comprises a series of square waves.
9. The optic tracking device as claimed in Claim 6, wherein the signal conversion circuit further comprises a current-limiting resistor adapted to be connected between the photo transistor and a power source for limiting electrical current flowing through the photo transistor.
- 10
- 15 10. The optic tracking device as claimed in Claim 4, wherein the microprocessor has an additional output terminal to which the light emitting element is connected for controlling actuation of the light emitting element.